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Statement of

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Administrator

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

before the
Committee on Science and Astronautics
House of Representatives

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Mr. Chairman and Members of the Committee:

It is an honor to appear here today to present the President's recommendation for authorization of funds for the program of the National Aeronautics and Space Administration for the fiscal year 1964.

I would like to make a general statement giving an outline of the program ahead. During your Committee's posture hearings held last week officials of NASA discussed the accomplishments of the past year. Today, Dr. Dryden is here and with your permission will discuss the accomplishments of the international program of NASA and speak about future trends in the space program. As you know, Dr. Dryden leaves for Rome in a few days to meet with representatives of the U.S.S.R. for further discussions and negotiations regarding cooperative programs. Dr. Seamans will be here tomorrow to

present the over-all NASA program, after which the responsible officials will be prepared to present the details of the various program areas in your subcommittee hearings.

The total NASA request for fiscal year 1964 is \$5,712,000,000 and is comprised of \$4,912,000,000 for research, development and operation and \$800,000,000 for construction of facilities.

Turning first to the programs carried under the section on Research, Development and Operation, there are five major program areas.

In the area of Space Sciences, NASA is requesting \$83⁶~~7~~.7 million. The Office of Space Sciences conducts programs to investigate the characteristics of the earth, the near and far regions of space, the sun and its influence on earth, the moon, and our neighboring planets. These programs are conducted using sounding rockets, earth orbiting satellites, lunar probes, planetary and interplanetary probes. At present, the United States clearly leads the world in hard won knowledge in the important areas of geophysics, solar physics, and interplanetary science. We are continuing an aggressive program in this area to assure that the United States retains its leadership.

Basic to NASA's space sciences program is the fact that scholars and researchers, scientists and engineers in qualified educational institutions widely spread throughout the Nation are the principal reliance for the production, extension, and communication of new scientific and technical knowledge. In carrying out these responsibilities, the universities, and the teachers in them, relate the training of additional people to the process of research. Consequently, they are in a position to rapidly expand the areas of fundamental knowledge on which our advances in engineering must be based and are sources of the additional scientific and technical personnel required by the United States in meeting the objectives of its aeronautical and space programs. In addition to the direct research support of the space program and training of new personnel, universities are also uniquely qualified to bring to bear the thinking of economists, businessmen, scientists and engineers, sometimes organized in multidisciplinary groups on the potentials for solving problems of economic growth through the utilization of the results of the research we do to accomplish our principal missions in space.

Thus, there is a close relation between our efforts in the space sciences and our efforts in the area of applications.

The budget estimate for our Applications program is \$140.7 million. In this area NASA is developing the spacecraft and technology needed to establish operational meteorological and communications satellite systems. In addition, the Office of Applications has the responsibility for working out ways and means to catalogue and make available to industry and other leaders innovations and processes arising from our space development efforts which can form a basis for economic growth or the solution of other problems faced by our society.

Useful work in space, including useful scientific work, depends on advanced technology.

The request for the Advanced Research and Technology program is \$5⁹~~8~~7.2 million.

The Office of Advanced Research and Technology is charged with providing a continuing and advancing broad technological and research base for this country's future aeronautical and space activities. In this program, research is conducted in the many fields related to aircraft, propulsion, launch vehicles, spacecraft, electronics, systems integration and management, tracking and data acquisition, re-entry, methods of simulation and training, and related human factors.

The technological advancements made as a result of this kind of research effort in the past have formed the basis for all our present aircraft and space systems, and a continuance of this kind of effort is the only sure way for this Nation to maintain its position of leadership in aeronautics and space activities in the years ahead.

The result of useful work in space, at present, is information, and this must be returned to earth to be of use.

The request for NASA's Tracking and Data Acquisition program is \$379.2 million. Every space flight mission in our present program, whether rocket development, scientific satellite, space probe, or manned spacecraft is undertaken to gather information in a form that can advance our base of knowledge and thus add an increment to our technological capability. The critical means to get such information back to the managers of the missions and then to the scientists in our laboratories and universities, is the world-wide network of tracking and data acquisition stations. It should also be noted that vast amounts of information received each day must be placed in a form that can be used by the scientist and engineer. It is the automatic data system utilized by NASA's Office of Tracking and Data Acquisition which accomplishes this task. Since the sun never sets on our work in

this area, it provides a continuing image all around the world of the way our efforts in space can be of value to all nations, and is thus doubly important because many of these tracking stations are manned by the nationals of other countries. In some cases the operation of foreign stations is completely paid for by other nations. This system of stations located around the world is a tremendous national and free world asset and makes a tremendous contribution to our Nation's space program.

With respect to the manned space flight program the request in this budget is for \$3,758,200,000. It is under this program that the Mercury project will be completed with the scheduled one-day earth orbit mission. We are proceeding at a fast pace with the Gemini project which will prove out much of our Apollo equipment, provide experience and training for our flight crews, and provide answers to important technological problems associated with rendezvous and long duration flight. This Gemini project is planned to lead logically on to the Apollo project in a continuing integrated schedule designed to give us the technical capability, the scientific advances, and the trained flight and ground crews, which will culminate, in so far as this budget is concerned, with landing

men on the moon, exploring its characteristics, and returning them safely to earth. All of these programs have specific objectives and form a total program that has a broad objective of establishing, for the United States, pre-eminence in manned space flight. This budget does not include programs to utilize this capability beyond the Apollo program.

As this Committee knows, gravity is one of the strongest forces in the physical world. To overcome gravity and launch men into space, we use a gigantic controlled release of energy in the form of fuel burned in rocket engines. The great value of the rocket engines NASA has developed is that they consume almost incomprehensibly large quantities of fuel and thus produce vast amounts of energy in a very short time. The Advanced Saturn's five engines burn 900 tons of fuel per minute and produce 7-1/2 million pounds of thrust. This is a really big machine and requires big buildings for its assembly, big test stands for static firings, and big launching facilities. The huge facilities required to handle these big space machines are an essential foundation for our Nation's space power. They can be used for military or civilian purposes as required. Since they are capital investments that will be useful over long

periods, the budgetary requirements are heavier in the earlier years of our programs.

The Construction of Facilities section of our request for 1964 totals \$800 million.

In the Committee's hearings today and tomorrow and the hearings to follow before your Subcommittees, responsible officials of NASA will make a complete presentation of these complex programs. In the four volumes of the justification books which have been submitted to you, a full breakdown of each and every part of the program has been made with an explanation of what, where, how, and when work will be done and what it will cost. It is important to note that the budget requested for the total program of NASA for fiscal year 1964 includes less than \$50 million for new programs. All the rest is to maintain the projects now under way on schedule and to pay the contractors for the work they have obligated themselves to do to meet these schedules.

President Kennedy, during a tour of some of our major space facilities last September, summed up our space objectives in these words:

"Those who came before us made certain that this country rode the first waves of the industrial revolutions,

the first waves of modern inventions, and the first wave of nuclear power.

"Our leadership in science and in industry, our hope for peace and security, our obligations to ourselves as well as to others, all require us to make this effort, to solve these mysteries, to solve them for the good of all men, and to become the world's leading spacefaring nation . . . only if the United States occupies a position of pre-eminence can we help decide whether this new ocean of space will be a sea of peace, or a new terrifying theater of war." My own view is that if we do not have a position of pre-eminence in space at the bargaining table of the nations, or in the minds of the world's leaders, the decisions that bring peace or war are not apt to be of our making.

You will note the President did not say that our national goal is that of landing the first man on the moon, or, for that matter, of being "first" with respect to any single achievement in space. We have done many things first, and we will do many other things first -- including, we hope, sending the first explorers to the moon -- but this is not the objective which the President stated.

Rather, he forcefully declared our determination to attain "a position of pre-eminence" in space and to "become

the world's leading spacefaring nation." That is the policy on which this budget is submitted to you.

This distinction needs to be understood. The mastery of space, and its utilization for the benefit of mankind, will not be determined by any single achievement. Superiority in the space environment with its great advantages and benefits will be won and very likely can be held by that nation which first fashions into a useable system all of the scientific knowledge, all of the technology, all of the experience, all of the space launch and terminal facilities, and all of the aids to space navigation required for safety and regular services.

These are the capabilities and resources which the United States must have, and this budget is designed to make rapid progress toward acquiring them.

Moving from our present position to achieve mastery of space requires that we add substantially to our scientific knowledge and to our utilization of technology. The NASA program is progressing on both of these fronts. In a complex effort such as this, conducted in a new medium about which much is yet unknown, the scientist and the engineer inevitably must work closely together and grow increasingly

dependent upon one another. We are encouraging this intimate partnership in every way we can in all our NASA Centers, in industry and in the Nation's universities.

In the exploration of space, the scientist must depend upon the engineer to design the equipment which will enable him to investigate conditions and forces which exist there. But at the same time, the engineer must look to the scientist for precise knowledge which will enable him to design equipment which will be more efficient and reliable in this harsh environment.

The NASA program, therefore, is designed to expand both science and technology. We are moving forward on a broad front. We have avoided becoming trapped in a narrow program -- one limited, for example, to developing only the technology needed to reach the moon with state-of-the-art hardware. To do so might well be to find, some years hence, that we had won the battle and lost the war as far as ultimate and enduring superiority in space is concerned.

Thank you for the opportunity to make this statement. The authority and funds requested have been determined by the President to be required to meet our space requirements in the light of all other governmental requirements. In this budget we believe we have an excellent program balance,

goals that can be met, a capability to shift emphasis as required by new developments, a capability to identify and take advantage of new opportunities as they arise, an effective marriage of the applicable resources of industry, universities, scientists, engineers, and governmental entities, and the means to do NASA's part to meet the emerging needs for coordinated effort within Government activities and operations. We have established effective, prudent, and business-like methods of going forward to do what is needed. We appreciate the support this Committee and the Congress has given this program. We respectfully urge your favorable consideration of this budget.